

2007 Cadillac Escalade

2007 TRANSMISSION Shift Lock Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

2007 TRANSMISSION

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SCHEMATIC AND ROUTING DIAGRAMS

SHIFT LOCK CONTROL SCHEMATICS

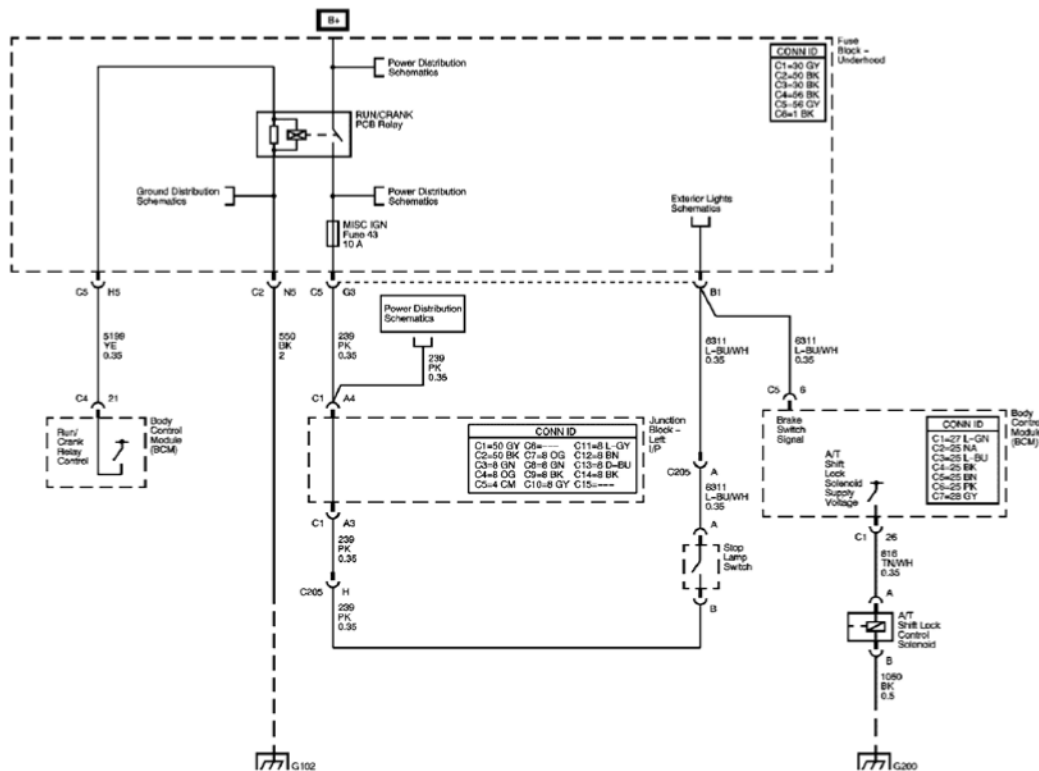


Fig. 1: Shift Lock Control Schematic
Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

SHIFT LOCK CONTROL COMPONENT VIEWS

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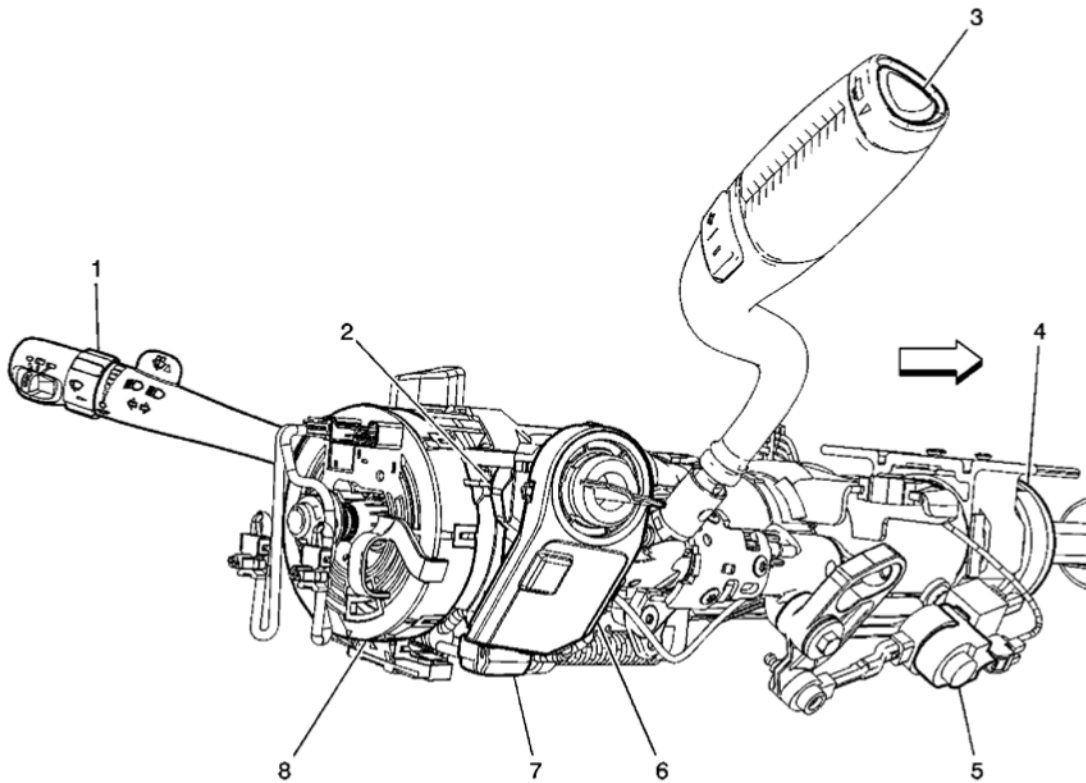


Fig. 2: Steering Column Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 2

Callout	Component Name
1	Turn Signal Multifunction Switch
2	Ignition Lock Cylinder
3	Tow/Haul Switch
4	Steering Angle Sensor
5	Shift Interlock Solenoid
6	Theft Deterrent Control Module
7	Ignition Switch
8	Inflatable Restraint Steering Wheel Module Coil

SHIFT LOCK CONTROL CONNECTOR END VIEWS

A/T Shift Lock Control Solenoid

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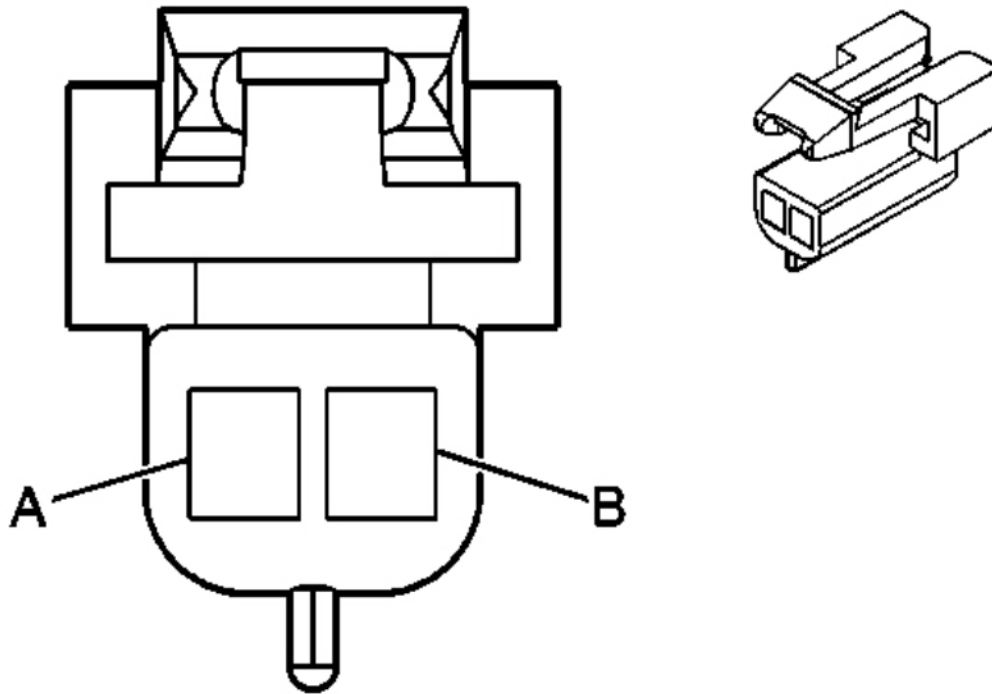


Fig. 3: A/T Shift Lock Control Solenoid Connector End View
Courtesy of GENERAL MOTORS CORP.

A/T Shift Lock Control Solenoid Connector Parts Information

Connector Part Information

- OEM: 12052832
- Service: 12101825
- Description: 2-Way F Metri-Pack 150 Series (GY)
- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

A/T Shift Lock Control Solenoid Connector Terminal Identification

Pin	Wire Color	Circuit No.	Function
A	TN/WH	816	A/T Shift Lock Solenoid Supply Voltage
B	BK	1050	Ground

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DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - AUTOMATIC TRANSMISSION SHIFT LOCK CONTROL

Begin the system diagnosis with **Diagnostic System Check - Vehicle** . The Diagnostic System Check - Vehicle will provide the following information:

- The identification of the control modules which command the system
- The ability of the control modules to communicate through the serial data circuit
- The identification of any stored DTCs and their status

The use of the Diagnostic System Check - Vehicle will identify the correct procedure for diagnosing the system and where the procedure is located.

SCAN TOOL OUTPUT CONTROLS

Body Control Module (BCM)

Scan Tool Output Control	Additional Menu Selection(s)	Description
Shift Lock Solenoid	Special Functions, BCM, Miscellaneous Test	Command supplies battery voltage to the A/T shift lock control circuit ON or OFF for 5 seconds.

SCAN TOOL DATA LIST

Body Control Module (BCM)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON, with the engine OFF. Transmission shift lever in the PARK position. Brake pedal released.			
Battery Voltage	BCM, Data Display, Charging Info	Volts	12.9 Volts
Shift Lock Solenoid Command	BCM, Data Display, Outputs	ON/OFF	OFF

Engine Control Module (ECM)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON, with the engine OFF. Transmission shift lever in the PARK position. Brake pedal released.			
BPP Circuit Signal	ECM, Electrical/Theft Data	Applied/Released	Released

Transmission Control Module (TCM) 4.8L, 5.3L and 6.0L

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON, with the engine OFF. Transmission shift lever in the PARK			

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position. Brake pedal released.

TR Sw.	Transmission Data	Park, Reverse, Neutral, Drive 5, Drive 4, Drive 3, Drive 2, Drive	Park
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Transmission Control Module (TCM) 6.2L

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON, with the engine OFF. Transmission shift lever in the PARK position. Brake pedal released.			
IMS	Transmission Data	Invalid, Drive 2, Reverse\Neutral, Neutral, Drive 6, Neutral\Drive 6, Park, Drive 3, Reverse, Park\Reverse, Drive 4	Park

SCAN TOOL DATA DEFINITIONS

Body Control Module (BCM)

Battery Voltage

The scan tool displays 0-20 volts. The scan tool displays the voltage as received by the BCM.

Shift Lock Solenoid Command

The scan tool displays On and Off. The scan tool displays the status of the shift lock control to the BCM.

Electronic Brake Control Module (EBCM)

BPP Signal

The scan tool displays Applied and Released. The scan tool displays Applied when the brake pedal is depressed and Released when the brake pedal is released.

Transmission Control Module (TCM)

IMS

The scan tool displays Invalid, Drive 2, Reverse\Neutral, Neutral, Drive 6, Neutral\Drive 6, Park, Drive 3, Reverse, Park\Reverse or Drive 4. The scan tool displays the position of the transmission internal mode switch (IMS).

TR Sw.

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The scan tool displays Park, Reverse, Neutral, Drive 5, Drive 4, Drive 3, Drive 2 or Drive 1. The scan tool displays the position of the transmission range switch.

DTC B2705

Circuit Description

The body control module (BCM) controls the automatic transmission shift lock control solenoid by providing a battery positive voltage to the solenoid. The BCM utilizes a smart driver to control the voltage supply circuit to the automatic transmission shift lock control solenoid. The smart driver monitors the voltage and current flow of the control circuit.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC B2705 Gearshift Unlock Circuit

DTC B2705

DTC Symptom	DTC Symptom Descriptor
02	Short to Ground

Conditions for Running the DTC

- The ignition switch is in the ON position.
- The brake pedal is pressed.
- The transmission is in the PARK position.

Conditions for Setting the DTC

Sets if there is a short to ground in the automatic transmission shift lock control solenoid control circuit

Action Taken When the DTC Sets

The BCM will not attempt to enable the voltage supply circuit of the automatic transmission shift lock control solenoid until the next key cycle.

Conditions for Clearing the DTC

- A current DTC B2705 will clear when the malfunction is no longer present and the ignition switch is cycled.
- All BCM history codes will clear after 100 ignition cycles with no current codes active during the 100 ignition cycles.

Diagnostic Aids

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- If the automatic transmission shift lock control circuit is shorted to ground, the automatic transmission shift lock control solenoid will be inoperative. The vehicle will shift out of PARK without pressing the brake pedal.
- Perform the tests while wiggling the wires and connectors. This may often cause an intermittent malfunction to appear. Refer to **Testing for Intermittent Conditions and Poor Connections**.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2: Listen for an audible click when the automatic transmission shift lock control solenoid operates. Command both the ON and OFF states. Repeat the commands as necessary.

3: This step tests for a good ground at the ground circuit of the automatic transmission shift lock control solenoid.

4: This step verifies that the BCM is providing battery voltage to the automatic transmission shift lock control solenoid.

5: This step tests if battery voltage is constantly being applied to the automatic transmission shift lock control solenoid.

DTC B2705

Step	Action	Yes	No
Schematic Reference: <u>Shift Lock Control Schematics</u> Connector End View Reference: <u>Shift Lock Control Connector End Views</u>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. With a scan tool, command the Shift Lock Solenoid output control ON and OFF. Does the automatic transmission shift lock control solenoid turn ON and OFF with each command?	Go to <u>Testing for Intermittent Conditions and Poor Connections</u>	Go to Step 3
3	1. Turn OFF the ignition. 2. Disconnect the automatic transmission shift lock control solenoid. 3. Connect a test lamp between the shift lock control solenoid ground circuit at the connector of the shift lock control solenoid and battery positive voltage. Does the test lamp illuminate?	Go to Step 4	Go to Step 10
	1. Turn OFF the ignition. 2. Connect a test lamp between the shift lock solenoid		

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4	control circuit and the shift lock solenoid ground circuit at the connector of the shift lock control solenoid. 3. With a scan tool, command the Shift Lock Solenoid output control ON and OFF several times. Does the test lamp turn ON and OFF with each command?	Go to Step 8	Go to Step 5
5	Does the test lamp remain illuminated?	Go to Step 6	Go to Step 7
6	Test the control circuit of the automatic transmission shift lock control solenoid for a short to battery voltage. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find and correct the condition?	Go to Step 13	Go to Step 9
7	Test the control circuit of the automatic transmission shift lock control solenoid for an open or short to ground. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find and correct the condition?	Go to Step 13	Go to Step 9
8	Inspect for poor connections at the harness connector of the automatic transmission shift lock control solenoid. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	Go to Step 13	Go to Step 11
9	Inspect for poor connections at the harness connector of the body control module (BCM). Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	Go to Step 13	Go to Step 12
10	Repair the open in the automatic transmission shift lock control ground circuit. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you complete the repair?	Go to Step 13	-
11	Replace the automatic transmission shift lock control solenoid. Refer <u>Automatic Transmission Shift Lock Actuator Replacement</u>. Did you complete the replacement?	Go to Step 13	-
12	Replace the BCM. Refer to <u>Control Module References</u> for replacement, setup, and programming. Did you complete the replacement?	Go to Step 13	-
13	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Running the DTC, as specified in the supporting text. Does the DTC reset?	Go to Step 2	System OK

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SYMPTOMS - AUTOMATIC TRANSMISSION SHIFT LOCK CONTROL

IMPORTANT: The following steps must be completed before using the symptom tables.

1. Perform the **Diagnostic System Check - Vehicle** before using the Symptom Tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to **Automatic Transmission Shift Lock Control Description and Operation**.

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the automatic transmission shift lock control. Refer to **Checking Aftermarket Accessories**.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **Testing for Intermittent Conditions and Poor Connections**.

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- **Shift Lever Does Not Move with Brake Pedal Depressed**
- **Shift Lever Can Be Moved without Brake Pedal Depressed**

SHIFT LEVER DOES NOT MOVE WITH BRAKE PEDAL DEPRESSED

Shift Lever Does Not Move with Brake Pedal Depressed

Step	Action	Yes	No
Schematic Reference: <u>Shift Lock Control Schematics</u> Connector End View Reference: <u>Shift Lock Control Connector End Views</u>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	1. Turn ON the ignition, with the engine OFF. 2. Apply the parking brake and block the wheels. 3. Press and hold the brake pedal. 4. Attempt to move the shift lever out of the PARK position.	Go to <u>Testing for Intermittent</u>	

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	Does the shift lever move out of the PARK position?	<u>Conditions and Poor Connections</u>	Go to Step 3
3	1. Turn OFF the ignition. 2. Install and scan tool. 3. Turn ON the ignition, with the engine OFF. 4. Press and release the brake pedal several times while observing the Shift Lock Solenoid Command parameter in the body control module (BCM) data list.		
	Does the scan tool display On and Off status?	Go to Step 4	Go to Step 6
4	1. Turn OFF the ignition. 2. Disconnect the electrical connector of the automatic transmission shift lock control solenoid. 3. Turn ON the ignition, with the engine OFF. 4. Press and hold the brake pedal. 5. Attempt to move the shift lever out of the PARK position.		
	Does the shift lever move out of the PARK position?	Go to Step 5	Go to Step 7
5	Test the control circuit of the automatic transmission shift lock control solenoid for a short to battery positive voltage. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find and correct the condition?	Go to Step 11	Go to Step 8
6	Press and release the brake pedal several times while observing the BPP Circuit Signal parameter in the engine control module (ECM) data list. Does the Scan tool display Applied and Released status of the parameter?	Go to Step 8	Go to <u>Stop Lamps Inoperative</u>
7	Inspect for poor connections at the harness connector of the automatic transmission shift lock control solenoid. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	Go to Step 11	Go to Step 9
8	Inspect for poor connections at the harness connector of the BCM. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	Go to Step 11	Go to Step 10
9	Replace the automatic transmission shift lock control solenoid. Refer <u>Automatic Transmission Shift Lock Actuator Replacement</u> . Did you complete the replacement?	Go to Step 11	-
	Replace the BCM. Refer to <u>Control Module References</u>		

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10	for replacement, setup, and programming. Did you complete the replacement?	Go to Step 11	-
11	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to Step 2	System OK

SHIFT LEVER CAN BE MOVED WITHOUT BRAKE PEDAL DEPRESSED

Shift Lever Can Be Moved without Brake Pedal Depressed

Step	Action	Yes	No
Schematic Reference: <u>Shift Lock Control Schematics</u> Connector End View Reference: <u>Shift Lock Control Connector End Views</u>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. With a scan tool, command the Shift Lock Solenoid output control ON and OFF. Does the automatic transmission shift lock control solenoid turn ON and OFF with each command?	Go to <u>Testing for Intermittent Conditions and Poor Connections</u>	Go to Step 3
3	1. Turn OFF the ignition. 2. Disconnect the automatic transmission shift lock control solenoid. 3. Connect a test lamp between the shift lock control solenoid ground circuit at the connector of the shift lock control solenoid and battery positive voltage. 4. Turn ON the ignition, with the engine OFF. Does the test lamp illuminate?	Go to Step 4	Go to Step 10
4	1. Turn OFF the ignition. 2. Connect a test lamp between the shift lock solenoid control circuit and the shift lock solenoid ground circuit at the connector of the shift lock control solenoid. 3. With a scan tool, command the Shift Lock Solenoid output control ON and OFF several times.		

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	Does the test lamp turn ON and OFF with each command?	Go to Step 8	Go to Step 5
5	Does the test lamp remain illuminated?	Go to Step 6	Go to Step 7
6	Test the control circuit of the automatic transmission shift lock control solenoid for a short to battery voltage. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find and correct the condition?	Go to Step 13	Go to Step 9
7	Test the control circuit of the automatic transmission shift lock control solenoid for an open or short to ground. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find and correct the condition?	Go to Step 13	Go to Step 9
8	Inspect for poor connections at the harness connector of the automatic transmission shift lock control solenoid. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	Go to Step 13	Go to Step 11
9	Inspect for poor connections at the harness connector of the body control module (BCM). Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	Go to Step 13	Go to Step 12
10	Repair the open in the automatic transmission shift lock control ground circuit. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you complete the repair?	Go to Step 13	-
11	Replace the automatic transmission shift lock control solenoid. Refer <u>Automatic Transmission Shift Lock Actuator Replacement</u> . Did you complete the replacement?	Go to Step 13	-
12	Replace the BCM. Refer to <u>Control Module References</u> for replacement, setup, and programming. Did you complete the replacement?	Go to Step 13	-
13	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to Step 2	System OK

REPAIR INSTRUCTIONS

AUTOMATIC TRANSMISSION SHIFT LOCK ACTUATOR REPLACEMENT

Removal Procedure

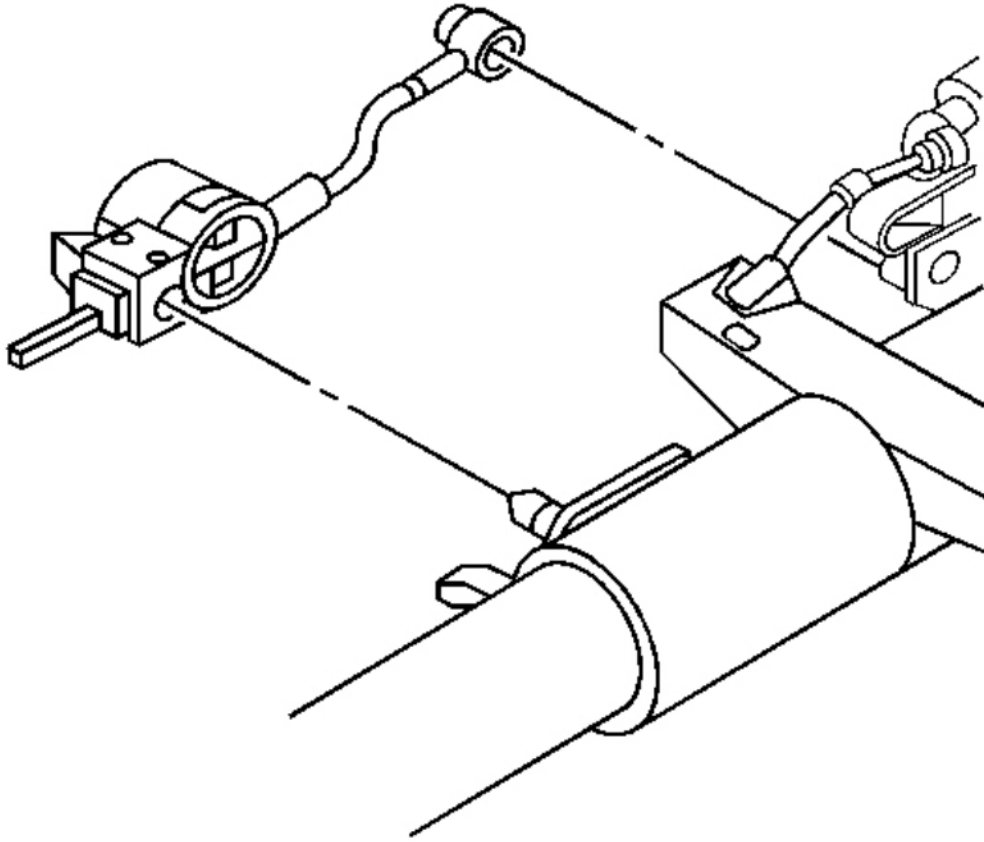


Fig. 4: View Of Automatic Transmission Shift Lock Control Actuator
Courtesy of GENERAL MOTORS CORP.

1. Disable the SIR system. Refer to **SIR Disabling and Enabling** .
2. Remove the knee bolster. Refer to **Knee Bolster Replacement (Cadillac)** or **Knee Bolster Replacement (Except Cadillac)** .
3. Put the shift lever clevis into the neutral position.
4. Disconnect the electrical connector.
5. Using a small screwdriver, pry the automatic transmission shift lock control actuator away from the steering column jacket and the cable shift cam.
6. Remove the shift lock control actuator.

Installation Procedure

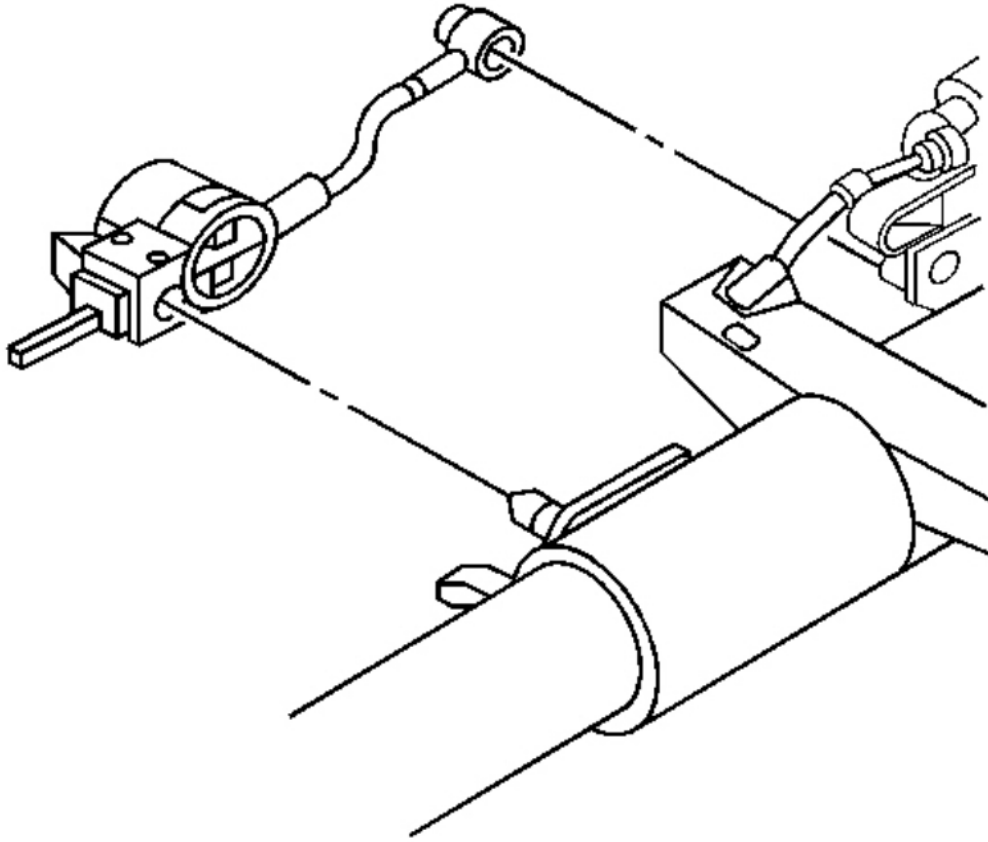


Fig. 5: View Of Automatic Transmission Shift Lock Control Actuator
Courtesy of GENERAL MOTORS CORP.

1. Firmly install the shift lock control actuator onto the steering column jacket and the cable shift cam.
2. Connect the electrical connector.

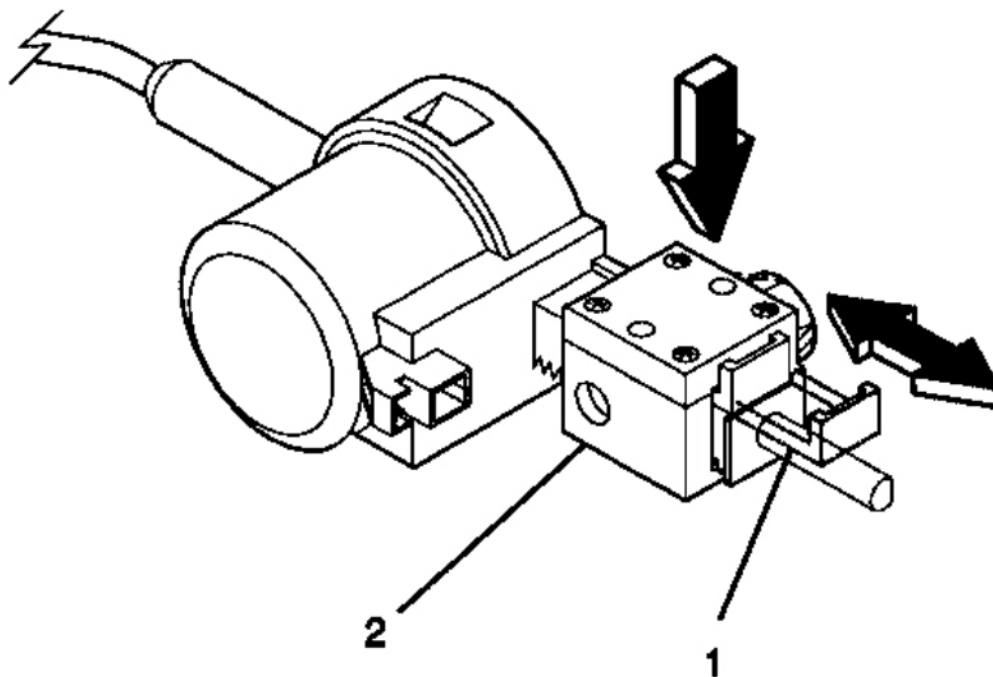


Fig. 6: Adjusting Automatic Transmission Shift Lock Control Actuator
Courtesy of GENERAL MOTORS CORP.

3. Adjust the shift lock control actuator (with the shift lever clevis in the neutral position) in the following way:
 1. Pull out the tab (1) on the adjuster block side (2) of the shift lock control actuator.
 2. Press on the adjuster block (2) to compress the internal adjuster spring which disengages the adjuster teeth. Slide the adjuster block (2) as far away from the actuator as possible.
 3. Lock the adjuster block (2) in place by pushing in on the tab (1).
4. Inspect the shift lock control actuator for the following items:
 1. The shift lock control actuator must lock the shift lever clevis when the shift lever clevis is put into the park position.
 2. Depress the brake pedal to move the shift lever out of the park position.
 3. The actuator will be energized.
 4. Readjust the shift lock control actuator if needed.
5. Install the knee bolster. Refer to **Knee Bolster Replacement (Cadillac)** or **Knee Bolster Replacement (Except Cadillac)**.
6. Enable the SIR system. Refer to **SIR Disabling and Enabling**.

DESCRIPTION AND OPERATION

AUTOMATIC TRANSMISSION SHIFT LOCK CONTROL DESCRIPTION AND OPERATION

The automatic transmission shift lock control system is a safety device that prevents an inadvertent shift out of PARK when the engine is running. The driver must press the brake pedal before moving the shift lever out of the PARK position. The system consists of the automatic transmission shift lock solenoid (serviced as the automatic transmission shift lock actuator), as well as the body control module (BCM) and engine control module (ECM). The shift lock solenoid is located within the steering column assembly.

The BCM controls the voltage supply circuit of the shift lock control solenoid. The following conditions must be met before the BCM will supply voltage to the shift lock control solenoid:

- The ignition is in the ON position.
- The ECM sends an input via GMLAN serial data to the BCM indicating the transmission is in the PARK position.
- The BCM determines the brake pedal is not applied according to the stop lamp switch.

Since the shift lock control solenoid is permanently grounded, the BCM supplies voltage to the automatic transmission shift lock control solenoid, mechanically locking the shift lever in the PARK position as the solenoid energizes. When the brake pedal is applied, the BCM turns the control voltage output of the shift lock control solenoid OFF, de-energizing the shift lock control solenoid. The de-energized solenoid releases the mechanical lock allowing the driver to move the shift lever out of the PARK position. When the transmission is out of the PARK position, the shift lock control solenoid remains de-energized.

During remote start operation the BCM will energize the shift lock control circuit, locking the shift lever in the PARK position.